



P.E.I.'s MOST PRECIOUS RESOURCE
RUSTICO BAY COMPLEX
WATERSHED ACTIVITIES



SURFACE WATER PROGRAM

MARCH 1990

THE CANADA—PRINCE EDWARD ISLAND
WATER MANAGEMENT AGREEMENT



Environment
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Prince Edward Island
Department of the Environment

RUSTICO BAY COMPLEX

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THE CANADA — PRINCE EDWARD ISLAND WATER MANAGEMENT AGREEMENT

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Environment Canada
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SURFACE WATER PROGRAM
MARCH 1990

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PREFACE

This report is one of a series produced as a result of the Canada - Prince Edward Island Water Management Agreement. The work was performed as part of the Watershed Inventory Project under the Surface Water Program.

It was initiated in order to gain a better understanding of the activities which may impact on the quality and quantity of surface waters which drain into Rustico Bay.

The report is intended to be used in conjunction with the report entitled "Activities Affecting Surface Water Resources - A General Overview" and the book of "Rustico Bay Watershed Complex Inventory Maps" which is maintained on file at Inland Waters Directorate, Environment Canada in Dartmouth, Nova Scotia. All references to maps in the report are to this atlas.

Mapping was performed using the 1:50,000 N.T.S. topographical series using the Universal Transverse Mercator (U.T.M.) grid system to the nearest one hundred (100) metres for point data. Non-point (polygon) data is also mapped where required. This mapping technique is easily transferable to the Geographical Information System (G.I.S.) which provides for updating and manipulation of the data.

ACKNOWLEDGEMENTS

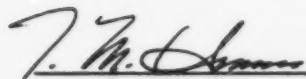
The co-chairmen of the Surface Water Program Committee would like to thank the following people for their help on this project:

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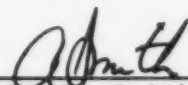

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1.0 INTRODUCTION

In November 1987, the Canada - Prince Edward Island Water Management Agreement was signed. The Agreement focusses upon several areas including groundwater contamination, surface water degradation and estuarine eutrophication. Of these, the Watershed Inventory Project, as part of the Surface Water Program, has been designed to identify current and future users of surface water and to document resource conflicts within twelve watersheds across the province. The Rustico Bay Watershed Complex (Figure 1.1) was identified as an area of study for the project.

2.0 GENERAL CHARACTERISTICS OF THE RUSTICO BAY WATERSHED COMPLEX

2.1 Description

The Rustico Bay Watershed Complex is located in the north central section of Queens County, P.E.I. The Hunter and Wheatley Rivers both drain a number of tributaries located before emptying into Rustico Bay. The Bay then opens to the north through a narrow channel into the Gulf of St. Lawrence.

The several glaciers which at one time covered Prince Edward Island have caused a gently undulating terrain across much of the province. Average elevations within the province are less than sixty-one (61) metres above sea level. The Rustico Bay Watershed Complex encompasses a generally rolling section of the Island. The southernmost areas are very hilly with maximum elevations exceeding one hundred and thirty-six (136) metres while the northern sections are somewhat flatter.

The area is largely rural with farms and small village located throughout. As is the case with the Island as a whole, the watershed is traversed by an extensive network of roads many of which are unpaved and not kept open during the winter.

The watershed drains a landbase of about two hundred square kilometres (201.17 km²). The length of the two major rivers, the creeks and their tributaries is approximately one hundred and twenty-eight kilometres (128.50 km). A physiographic comparison of Prince Edward Island with the Rustico Bay Watershed Complex (Figure 2.1) reveals that the watershed contains more cleared land (62.70%) and less forested land (28.00%) than the provincial average. The rest of the watershed is composed of either estuaries (8.80%), ponds (0.30%) or swamps (0.20%), (Taylor, 1989).

2.2 Soils

Prince Edward Island's podzol soils, formed mainly from

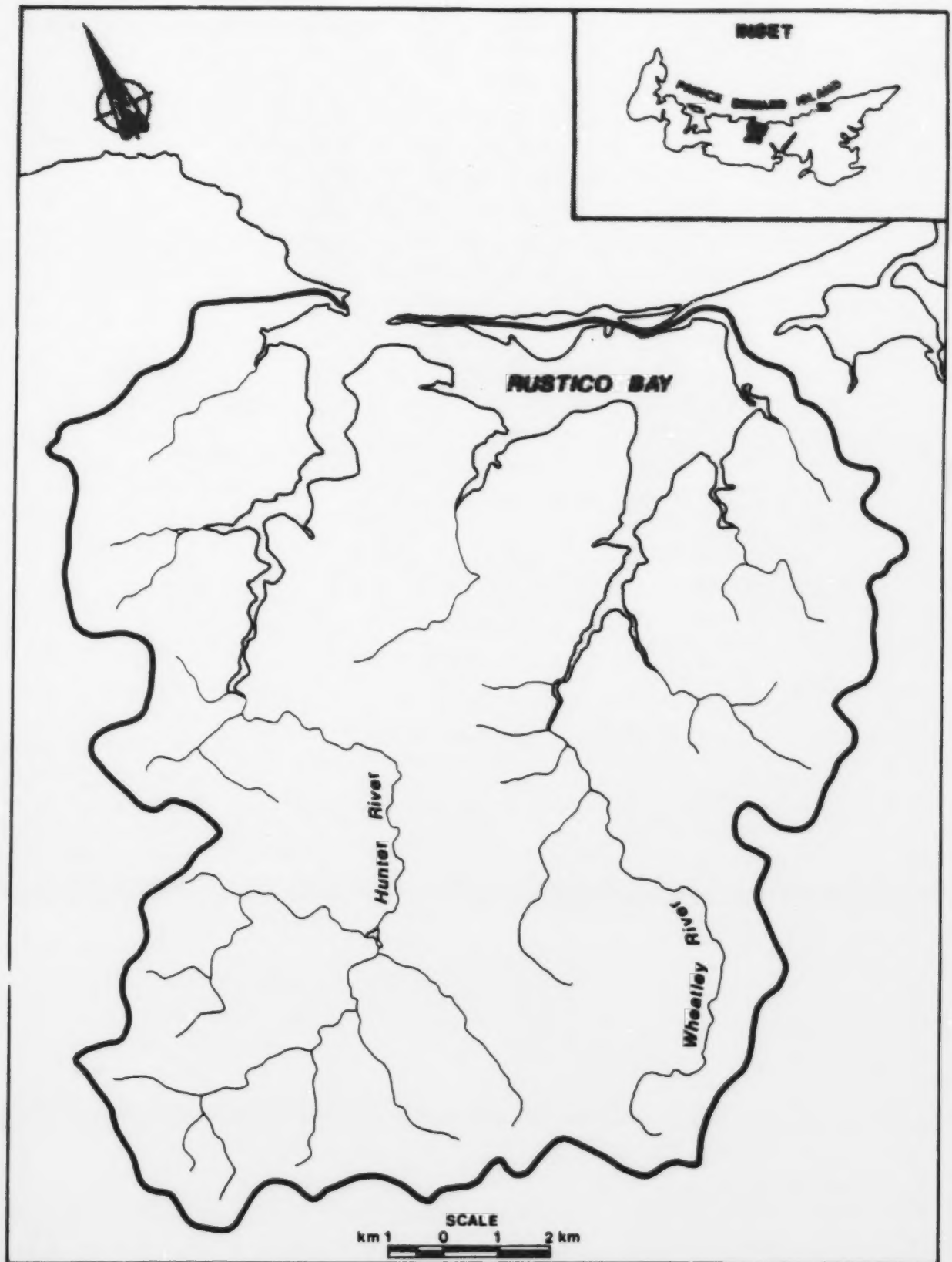
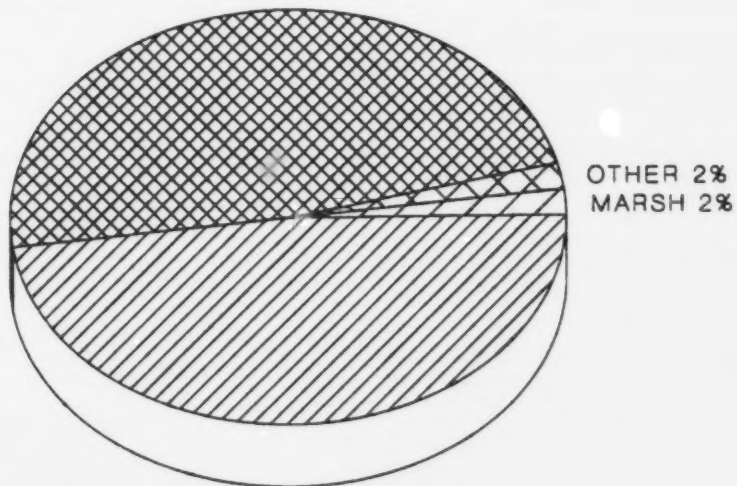


Figure 1.1 Rustico Bay Watershed Complex

PRINCE EDWARD ISLAND

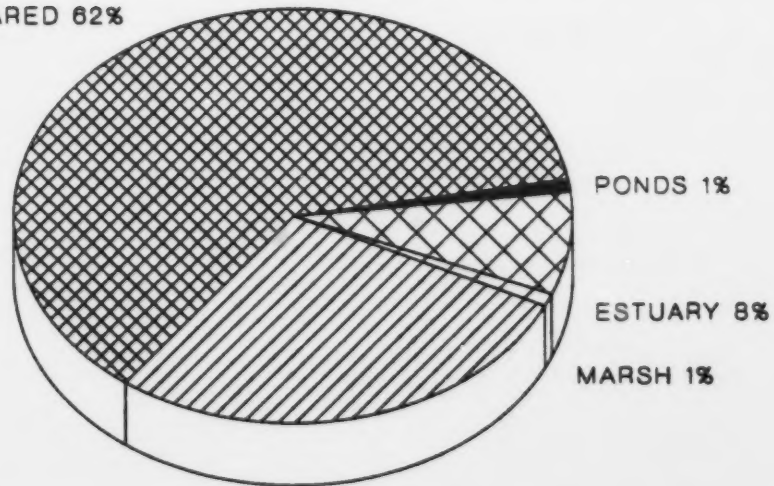
CLEARED 48%



FORESTED 48%

RUSTICO BAY WATERSHED

CLEARED 62%



PONDS 1%

ESTUARY 8%

MARSH 1%

FORESTED 28%

Figure 2.1 Physiographic Comparison Between Prince Edward Island and the Rustico Bay Watershed Complex

the weathering of sandstone and the deposition of glacial till, are generally stone-free, sandy and permeable. The Rustico Bay Watershed Complex is composed of varying amounts of Class 2S, 3S, 3T, 4T, 5S, 5T, 7I and 7S. Approximately sixty-five percent (65%) of the soils are Class 2, twenty percent (20%) Class 3, less than five percent (5%) Class 4, ten percent (10%) Class 5 and less than five percent (5%) Class 7 (Canada Land Inventory, 1968).

3.0 AGRICULTURAL OPERATIONS

Agriculture forms a major part of Prince Edward Island's economy. Many parts of the Rustico Bay Watershed Complex's terrain are well-suited for crop and livestock operations. There are sixty-four (64) livestock farms located throughout the watershed (Map 11L/6). Crop production is also common with the major crops being potatoes, hay, oats, barley, corn and clover.

3.1 Dairy Operations

There are thirty (30) dairy operations in the watershed (Figure 3.1) each containing thirty (30) or more head (30 milkers and 30 feeders) of cattle (Newson, 1989).

3.2 Beef Operations

Seven beef cattle farms (Figure 3.1) with fifty (50) or more head (50 cattle plus 50 feeders) are present within the watershed (Murphy, S., 1989).

3.3 Hog Operations

Twenty-three (23) hog operations (Figure 3.1) are within the boundaries of the watershed. Each has an annual production of eight hundred (800) or more animals (Johnson, 1989). Since hogs are normally housed indoors the only threats to surface water quality arise from the improper storage and disposal of manure.

3.4 Poultry Operations

There are four large scale poultry farms (Figure 3.1) within the Rustico Bay Watershed Complex (Johnson, 1989).

3.5 Stock Watering

Most livestock on Prince Edward Island is watered using groundwater piped into troughs (Murphy, S., 1988). However, there have been some instances noted in which animals were observed drinking from streams traversing the pastures (refer

LIVESTOCK OPERATIONS RUSTICO BAY WATERSHED

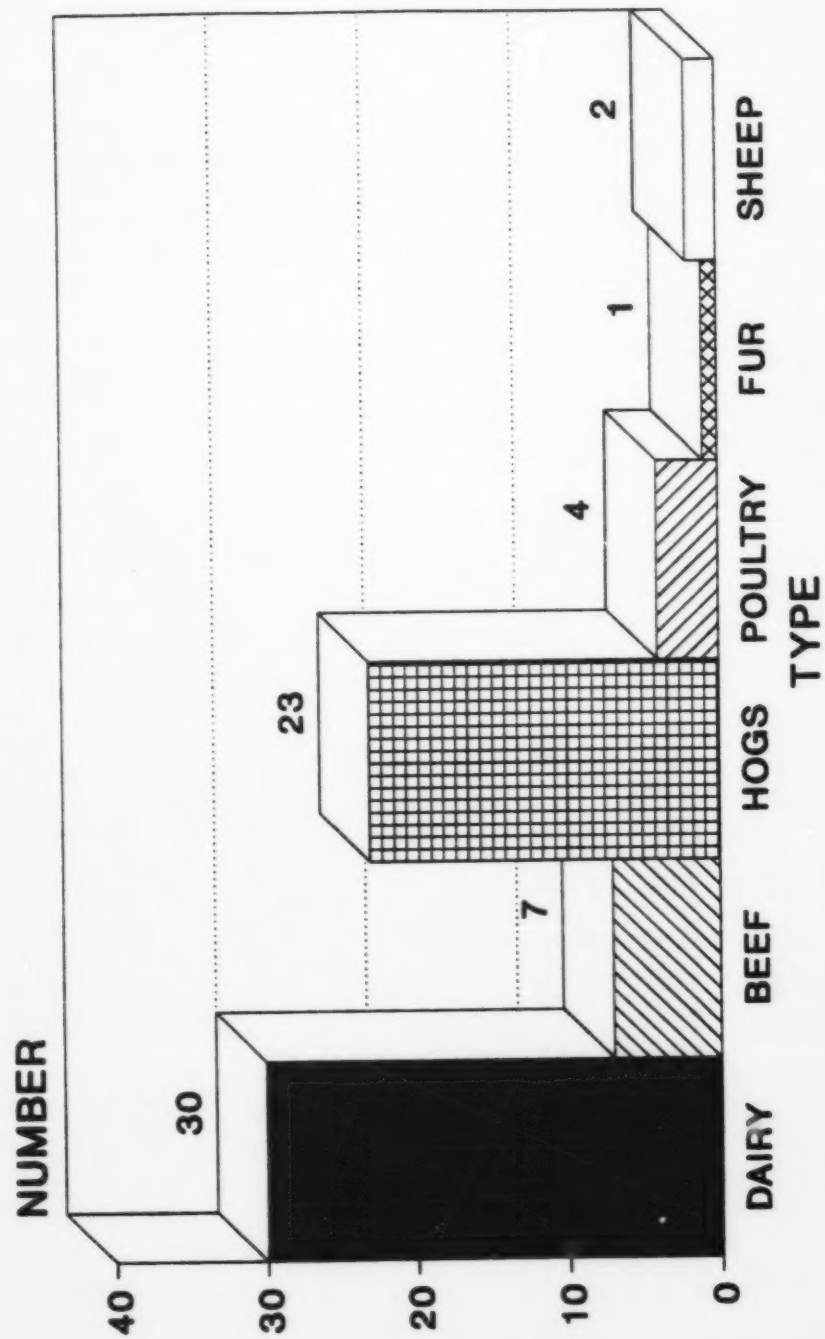


Figure 3.1 Livestock Operations Located Within the Rustico Bay Watershed Complex

to Section 11.2). This leads not only to destabilization of the stream banks and siltation but also to bacterial contamination of the water.

3.6 Irrigation

The Prince Edward Island Department of Agriculture does not keep specific records on irrigation occurring within the province. Water used for irrigation generally comes from a surface water source such as a farm pond or stream. In dry years there are probably more farmers who irrigate their crops (Clough, 1988). This practice may affect the amount of water available for users in downstream locations. Therefore, a monitoring system should be in place so as not to jeopardize the resource.

3.7 Dead Stock Burial

There are no known dead stock burial sites within the watershed. Farmers can either pay a service fee to have their stock discarded at an approved disposal site or they can sell their dead animals to Maritime Pet Foods which is located in Stanchel. They may also bury the carcasses on their own land (which is the most likely scenario).

3.8 Erosion Control Projects

There are seven erosion control projects in the Rustico Bay Watershed Complex (Map 11L/6) including three tile drainage projects which have enabled farmers to increase the productivity of low class agricultural lands (DeHaan, 1989), two grassed waterways, one open ditch and one diversion ditch (Pharo, 1989).

4.0 FISH AND WILDLIFE RESOURCES

Fish and wildlife resources are important to both residents and tourists alike on Prince Edward Island in terms of the recreational and economic benefits they provide. Fish and wildlife on P.E.I. are dependent upon surface water resources either for primary habitat or as a source of drinking water.

4.1 Angling Areas

There are a number of angling sites located along the rivers in the watershed (Map 11L/6) including three listed in Angling on Prince Edward Island (P.E.I. Department of Tourism and Parks, 1988). The other areas have been delineated by the Fish and Wildlife Branch's Conservation Officers who are responsible for patrolling the area (Clements, Hurry, 1989).

4.2 Hunting Areas

The entire Rustico Bay Watershed Complex is an excellent area for hunting waterfowl (Clements, 1989). The numerous grain fields provide an abundant food supply during their annual migrations. As well, the many woodlots and hedgerows separating agricultural fields supply suitable habitat for such upland game species as; snowshoe hare, ruffed grouse, Hungarian partridge, snipe and woodcock (Map 11L/6). Since wildlife is known to be migratory, in response to habitat requirements and food availability, their boundaries may change from year-to-year.

4.3 Trapping Areas

As with hunting areas, the trapping areas located within the Rustico Bay Watershed Complex (Map 11L/6) do not have consistent boundaries from year-to-year although they are most often located near waterways (Hurry, 1989). They are dependent both upon the movement of animals and the preferences of trappers. Species trapped include muskrat, fox, mink and snowshoe hare. The amount of trapper activity depends on the fur market conditions. There are not any active beaver dams in the watershed (Dibblee, 1989).

5.0 RECREATIONAL ACTIVITIES

Surface water and some recreational activities go hand-in-hand (swimming and boating). Other activities (hiking and skiing) are often enjoyed in close proximity to streams and rivers. Similarly, major recreational facilities (provincial parks and campgrounds) are generally situated adjacent to Island surface water resources.

5.1 Prince Edward Island National Park

A portion of Prince Edward Island National Park, Rustico Island, forms the northern boundary of the watershed (Map 11L/6). Rustico Island is fairly small in size but is important as a nesting area for shorebirds. Its relative remoteness initially prevented a significant amount of recreational activity but a causeway built in 1960 has since created increased access to the area. A campground and an open air theater are presently located on the Island. The campground contains one hundred and forty-eight (148) sites with thirty (30) flush toilets (P.E.I. Department of Tourism and Parks, 1989).

5.2 Additional Accommodation's Facilities

Fifty-five (55) additional private accommodation's

facilities are located in the watershed. These range from bed and breakfast operations to large motels and campgrounds. Various activities including swimming, angling, trail rides and boating are available at some of the sites.

Two large campgrounds are also operational within the watershed. Cymbria Campground, located on the shore of the Bay near Cymbria (Map 11L/6), has eighty-eight (88) campsites, twelve flush toilets, six showers and a sewage dumping station. Rustico Resort, also located near Cymbria (Map 11L/6), has in addition to its motel units, forty (40) campsites with four flush toilets. Horseback riding, golf and boating are all available at the Resort (P.E.I. Department of Tourism and Parks, 1989).

5.3 Swimming Areas

Generally, people will swim where they desire. In P.E.I. many of the best swimming areas are coastal. This excludes large parts of the Rustico Bay Watershed Complex.

The only organized swimming activities on the Island occur through the Canadian Red Cross Society which does not conduct swimming events in the Rustico Bay area (MacLean, 1989). Ponds, areas near bridges and the wider sections of the Rivers would be those most concentrated with swimmers.

5.4 Boating / Canoeing Areas

The Prince Edward Island Recreational Canoeing Association is able to provide information on various canoeing routes throughout the province but does not offer any organized trips (P.E.I. Department of Tourism and Parks, n.d.).

The Wheatley River is accessible via the Route #224 Bridge in the Village of Wheatley Bridge. One can travel downriver until exiting at the Route #6 Bridge near Cymbria (Map 11L/6).

Hunter River is accessible from the New Glasgow Bridge on Route #224. The River can be canoed to the Route #6 Bridge at Rusticoville (Map 11L/6).

Rustico Bay, itself, is good for canoeing and other boating activities except where it exits into the Gulf of St. Lawrence. One can also enter any of the minor Creeks which flow into the Bay (Map 11L/6).

Boardsailing is gaining popularity on P.E.I. Rustico Bay is fairly sheltered and provides good windsurfing opportunities. The major rivers have significantly large open areas and are also good for boardsailing.

5.5 Hiking / Cross-Country Skiing / Snowshoeing

For the nature-buff or recreational enthusiast, a good method in which to see an area is on foot, either by hiking, cross-country skiing or snowshoeing. In this way, people can go at their own pace, perhaps photographing what catches their eye or just enjoying the great outdoors.

There are no organized hiking or cross-country trails the watershed although the several woods' roads and unpaved roads are well-suited for this purpose.

Snowshoeing may be undertaken anywhere within the watershed although the areas utilized for hiking and cross-country skiing most likely have the highest use for snowshoers as well.

5.6 Snowmobiling / Horseback Riding

There are not any snowmobiling clubs in the watershed and therefore no organized excursions. Individuals and small groups of snowmobilers are often observed riding through fields and along woods' and seasonal roads.

There are two commercial horseback riding operations within the watershed. One is located at Bells Pond while the other is at the Rustico Resort in Cymbria (Map 11L/6). Both offer rides through wooded areas and along streams. Rustico Resorts also offers rides along coastal beaches.

5.7 Unplowed (Seasonal / Scenic Heritage) Roads

Many local and unpaved roads within the Rustico Bay Watershed Complex are not open for vehicular traffic during the winter months (Map 11L/6). Their relative abundance provides additional venues for winter recreational activities such as cross-country skiing, snowshoeing and snowmobiling. Often not well travelled, even during the warmer months, these roads may further supply recreational opportunities for hiking, cycling and horseback riding.

Several roads across the Island have been designated as Scenic Heritage Roads as a result of their natural and historical significance. There have not been any roads so designated within the Rustico Bay Watershed Complex (Horne et. al., 1988).

6.0 FISHERIES OPERATIONS

The fishing industry is very important to the economy of Prince Edward Island. All of the province's major watersheds have an estuarial component which supports a fishery to some

extent. The value of the fish and shellfish species landed from within the Rustico Bay Watershed Complex during 1987 was in excess of seventy-six thousand dollars (\$76,106), (Figure 6.1). All finfish and shellfish harvesting can be placed into three general categories, namely; licensed commercial, non-licensed commercial and recreational and finfish aquaculture.

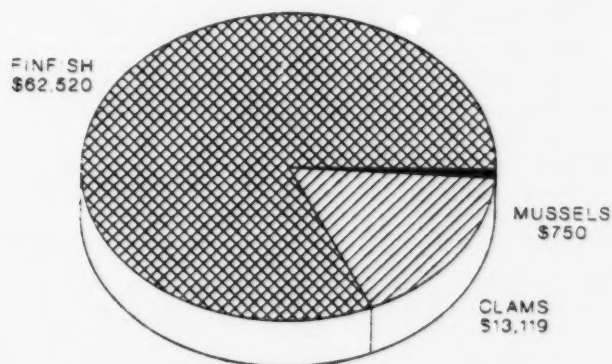


Figure 6.1 1987 Fish/Shellfish Landings Within the Rustico Bay Watershed Complex

6.1 Licensed Commercial

Shellfish concentrations within the watershed have been identified by Department of Fisheries and Oceans personnel (Map 11L/6). Bar clams are taken on a commercial basis from the sand bar at the mouth of Rustico Harbour.

The Rustico Bay Complex is open to eel netting on a seasonal basis but is open to eel spearing on a year round. Smelt catches are regulated by season and are monitored by Department of Fisheries and Oceans staff. Box, gill and bag nets are used to trap smelt during the annual season (October to February). Silverside are harvested near the Rustico Wharf and from the Hunter River below New Glasgow (McInnis, 1989).

6.2 Non-Licensed Commercial / Recreational

Trout, mackerel and smelt are harvested on a recreational basis from Rustico Bay. Quahogs, clams and mussels are also harvested from public areas.

Soft-shelled clams are harvested in Rustico Bay at the mouth of Chappel Creek on both a commercial and recreational basis. Despite the closure of some parts of Rustico Harbour and Rustico Bay due to bacterial contamination, the watershed currently supports significant non-licensed commercial and recreational finfish and shellfish harvests. Any shellfish which are removed from the contaminated areas must be

transferred to unpolluted areas for flushing (a period of three to four weeks). However, those people who harvest shellfish from contaminated areas must first obtain a conditional permit from the Department of Fisheries and Oceans.

6.3 Aquaculture Operations

There are three finfish aquaculture sites within the Rustico Bay Watershed Complex (Map 11L/6). One is a sea cage containing six thousand (6000) rainbow trout and two thousand (2000) Atlantic Salmon. It is located between the two main wharves in Rustico. The second operation is a hatchery below Andrews Pond in New Glasgow Mills which raises forty thousand (40,000) rainbow trout. It uses about 900 litres per minute of surface water and has no treatment system for wastes. A third facility, located above Andrews Pond, contains about twenty five hundred (2500) rainbow trout. No waste treatment facilities are in place for this operation which uses about 200 litres per minute of ground water (Murphy, L., 1989).

There are also four mussel leases, two finfish leases and one oyster lease in the watershed (Map 11L/6), (Small, 1989).

7.0 INDUSTRIAL OPERATIONS

Many of the industrial operations located on Prince Edward Island have an effect on surface water resources in one way or another. Some discharge both treated and untreated wastes directly into streams and rivers while others allow for the seepage of pollutants to surface or groundwater sources. Some industrial operations require a surface water or groundwater source for use in their processes.

7.1 Stormwater Drainage

A small stormwater drainage system in North Rustico discharges into Rustico Harbour. The Village of Hunter River also has a small system which empties into the Hunter River on both sides of the Highway #2 Bridge (Mason, 1989).

7.2 Sewage Lagoons

There are four sewage lagoons within the Rustico Bay Watershed Complex (Map 11L/6). The largest is located in North Rustico, adjacent to Rustico Harbour and operates throughout the year. Central Queens Elementary School in Hunter River uses an external aeration treatment process which is most heavily employed during the winter months. Two seasonal tourist operations, Blue Heron Cottages in Wheatley River and Cymbria Campground in Oyster Bed Bridge, also have sewage holding lagoons (Reeves, 1989).

7.3 Food Processing Operations

There are two food processing facilities located within the watershed (Map 11L/6), (Parker, 1989). Both are located in the Village of New Glasgow. Elmer's Yogurt is a dairy operation which has expanded into the production of ice cream and fresh and frozen yogurt. Liquid wastes derived from the processing of these foods are disposed of through a septic tank and tile system.

The Prince Edward Island Preserve Company is a small operation involved in the production of jams, vinegars and other edibles. Hot water used for the sterilization of bottles is dumped directly into the Hunter River. The proximity of the plant to the River dictates that sewage and wash water has to be stored in a 3800 litre holding tank located beside the Hunter River. It is emptied by a disposal company about five times a year and transported to a dumping site. The potential for problems at this site stems from the possibility of overflow from the septic tank running into the River. Concentrated acetic acid which is used in the production of vinegar is also stored on the site and if spilled poses a potential hazard to both wildlife and the quality of surface water.

7.4 Abandoned, Active and Unapproved Dumps

During 1982-83, the P.E.I. Department of Community and Cultural Affairs, in conjunction with Environment Canada, performed a study in which abandoned, active and unapproved waste disposal sites on Prince Edward Island were located and inspected (Water Resources Section, 1983). Of prime concern during the Inventory was the potential for groundwater contamination. Nineteen sites were identified within the Rustico Bay Watershed Complex (Map 11L/6).

As part of the inventory a scoring system was used to rate and prioritize (Priority I, II and III) each site on the basis of actual and potential environmental effects. Priority I sites were rated as being most hazardous to the environment; Priority II dumps were less hazardous; while Priority III sites were generally very small discriminate sites which were not considered to be environmentally hazardous. Evaluation revealed one Priority I, six Priority II and twelve Priority III dumps.

The Air and Solid Wastes Branch of the P.E.I. Department of the Environment has also identified three active approved dump sites. Two are container sites located at Cymbria and Darlington while the other is a landfill located outside of the Village of North Rustico (Map 11L/6).

There is no established program for hazardous waste disposal on Prince Edward Island (Curley, 1988). However, the Air and Solid Wastes Branch cooperates with their federal counterparts in controlling toxic waste disposal. For example, asbestos, which has been removed from buildings is double-bagged and dumped at landfill sites. Agricultural pesticides are sometimes left at dumpsites illegally. Since it is difficult to regulate such practices, remnant chemicals could become a potential hazard to both surface and groundwater resources.

The only other major form of toxic wastes on P.E.I. are polychlorinated biphenols (PCB's). As these compounds do not break down under normal conditions, they must be stored until they can be transported to a proper disposal site (located off-Island). There are not any registered PCB users or PCB storage sites located within the Rustico Watershed Complex (Guardian - Patriot, 1988). Hazardous materials are not generated in significant amounts within the watershed to seriously threaten its surface water resources.

7.5 Excavation Pits

Scattered throughout Prince Edward Island are numerous excavation pits used for the private and commercial removal of sandstone, and to lesser amounts, gravel and sand. Six registered active excavation pits are found within the Rustico Bay Watershed Complex (Map 11L/6), (Eaton, 1989). Records are not kept concerning the quantity of material removed from the individual pits and there are other pits for which permits have not been obtained. As well, records are not maintained concerning the number of non-operational or abandoned pits (Murphy, C., 1988).

7.6 Salt / Sand Storage Locations

The P.E.I. Department of Transportation and Public Works maintains a number of salt/sand storage areas across the Island. At these temporary sites, the salt and sand is stored directly on the ground with little or no site preparation. Often their locations change thereby yielding both abandoned and active sites. There are four active sites in the watershed. They are located in the communities of North Rustico, Hazlegrove, Brookfield and Oyster Bed Bridge (Map 11L/6).

7.7 Snow Disposal Sites

There are not any problems associated with snow accumulation on the streets and roads in the watershed because of the small size of the communities. Snow is plowed into the

ditch, the nearest open field or sometimes pushed off of local wharves. Therefore, the effects of this activity on surface water resources are minimal.

7.8 Additional Industrial Activities

A number of sawmills within the watershed are operated as small businesses. Some of the mills are mobile (usually powered by tractors) and will process wood at the lot while others are fixed and are powered by water, generators or electricity. Sawmill waste can increase the biological oxygen demand of waterways and, in some cases, cause increases in the acidity (Godfrey, 1989). The Rustico Bay Watershed Complex is geared mainly towards tourism although fisheries and agriculture are also important.

8.0 ALTERATIONS OF NATURAL FEATURES OF WATERWAYS

Individuals or groups wishing to alter a water system directly or indirectly to improve its recreational potential, to provide a reservoir for agricultural purposes or fire protection, or to construct a stream crossing, must seek approval from the Water Resources Branch of the P.E.I. Department of the Environment (Environmental Protection Act, Sections 10 and 11).

8.1 Application Process and Requirements

Alteration applications are subject to government control under the P.E.I. Environmental Protection Act (Section 10) and the Canada Fisheries Act (Chapter F-14, Section 20). Before requests are given final approval by the Head of the Watercourse Alteration Advisory Committee, they are reviewed by several Federal/Provincial Government and private agencies. Once approval is granted, inspections are carried out to ensure that the recommendations of the Committee are being followed.

Application considerations include the following criteria: the well-being of the fisheries resource; possible changes in water quality; stream-side cutting leading to loss of essential food and cover for wildlife; and the effects of the alteration on other types of wildlife.

Types of alterations include; installation of dams and/or fishways, bypass pond construction, roadway culvert or bridge installation, rock gabion installation and the infilling of marshes. Infilling applications, most often, are rejected since the practice results in a loss of wildlife habitat.

Since P.E.I. soils are highly susceptible to erosion, proponents who alter waterways must undertake erosion control

measures throughout the construction process.

8.2 Dam Inspections

Most of the sixteen dams in the watershed were inspected during the Watershed Inventory Project (Map 11L/6). Descriptions of the dams are contained in Appendix A. Some were found to constitute a total barrier to fish passage were due to the design of the dams, breaching, breakdown of the structures or debris within the waterways (See Section 11.3).

8.3 Fishways

On Prince Edward Island whenever an alteration is made to a waterway, the continued passage of fish must be ensured [Canada Fisheries Act, Chapter F-14, Section 20, (1)]. This involves, in some cases, the construction of a fishway. Various fishway designs are available with the type constructed dependent upon the species of fish to be passed and the water level fluctuations within the impoundment.

The three fishways in the watershed were identified and field checked (Map 11L/6). Hardys Pond and Millvale Pond are of the pool-and-weir design while the other, located at Henrys Pond near Granville, is a combination vertical slot and Denil fishway.

8.4 Road - Stream Intersections

The P.E.I. Department of Transportation and Public Works maintains a reference map which provides an up-to-date record of all major highway structures, that is, those over 1.2 metres in diameter, within the province. The Rustico Bay Watershed Complex contains forty-two (42) such structures (Map 11L/6).

The Watershed Inventory Project also identified fourteen additional road-stream intersections which, due to their smaller size, are not kept on file at the Department of Transportation and Public Works (Map 11L/6). These areas were located via 1:50,000 N.T.S. maps but not all have been field checked due to time and manpower constraints.

There are often repairs which can be made to the design of the roadway culverts which will then permit the passage of fish through the structures. This involves the installation of baffles or back flow devices which allows for decreased water flow and increased water depth in the structures.

8.5 Rail - Stream Intersections

Earlier this century, railroads on Prince Edward Island were a vital component in the transportation of goods across

the Island. However, due to increased rail costs and more efficient trucking methods, its importance is rapidly decreasing. Therefore all lines across the province were abandoned effective January 1990. After the line is abandoned, CN Real Estate contracts out for the removal of the ties and rails. Crossing structures are not usually removed since they are often more useful if left in place.

There is only one major railway-stream intersection on the line (Map 11L/6). Regular inspection and maintenance should be continued so as to ensure its ability to pass fish.

9.0 WETLANDS

Wetlands include salt marshes, intertidal flats, bogs, freshwater marshes, swamps and ponds. They are important for many reasons (Canadian Wildlife Service, n.d.):

1. as wildlife habitat;
2. act as natural filters;
3. bind pollutants thereby slowing the eutrophication process;
4. reduce flooding by acting as reservoirs; and
5. recharge the groundwater supplies.

During 1983 - 84 any wetlands over 0.25 hectares on Prince Edward Island were inventoried. The objective of the program was to provide information on the classification, size, distribution and wildlife value of P.E.I. wetlands.

9.1 Freshwater Wetlands

All freshwater wetlands within Prince Edward Island were identified during the Inventory and were given a wildlife value based on a wide array of parameters. The wetlands received a score between 36 and 108 with a score of 60+ indicating generally more productive areas.

Nineteen (19) freshwater wetlands with a score of 60+ were delineated within the Rustico Bay Watershed Complex (Map 11L/6), (Canadian Wildlife Service, n.d.).

9.2 Coastal Wetlands

Coastal wetlands were classified and scored as coastal units during the wetland inventory. The coastal unit score was calculated using the total of the scores from six component types of wetlands along with five additional factors. Added to that was a value for the disturbance status of the unit. The total coastal unit score indicated its productivity and provides a measure of its importance to wildlife. The coastal

unit scores ranged from 10 to 1500 points and were indicated as the sum of all wetlands within the unit.

There are eighteen (18) wetlands which are classified as coastal units in the watershed (Map 11L/6), (Canadian Wildlife Service, n.d.).

9.3 Ducks Unlimited Canada Management Sites

Ducks Unlimited Canada is active on Prince Edward Island in the enhancement and management of wildlife habitat. Several management techniques are employed for this purpose. Installation of water control devices such as drop inlets and stoplog control structures allow for the creation of ponds and the regulation of water levels in order to maintain optimal habitat conditions. Fishways are usually installed with the water level control structures in order to allow for the continued passage of fish into and out of the impoundment.

There are not any active Ducks Unlimited sites in the watershed (Smith, 1989).

10.0 ADDITIONAL ACTIVITIES WITHIN THE RUSTICO BAY WATERSHED COMPLEX

10.1 Hydrometric Station / Water Chemistry Data

The first streamflow data collected in Prince Edward Island was from the Dunk River at Rogers Mill which was in operation between 1919 and 1935. There was one station at Hunter River for which data to 1922 is available (NAQUADAT No. 01CC001), (Map 11L/6).

Land use characteristics for the basin which drained to this station has been determined by the Inland Waters Directorate, Environment Canada, Dartmouth, Nova Scotia (Table 10.1).

Table 10.1 Land Use Characteristics of the Hydrometric Station Located Within the Rustico Bay Watershed Complex

Station Number	Drainage Area (km ²)	Forest Area (km ²)	Cleared Area (km ²)	Swamp Area (km ²)	Pond Area (km ²)	Basin Perimeter (km)	Total Length of Stream (km)	Stream Gradient (%)	Period of Record
01CC001	42.70	18.10	24.50	0.002	0.044	29.10	35.40	0.69	1919-1922

In addition, the Water Quality Branch, Inland Waters Directorate, Environment Canada, Moncton, New Brunswick also maintains somewhat limited data associated with the following

studies:

- P.E.I. Groundwater Study (May 1972 - September 1973);
- P.E.I. Surface Water Quality Survey (July 1972);
- Water Quality Board National Water Quality Monitoring (April 1974 - March 1978); and the
- Toxic Chemical Survey (1985).

Parameters monitored included the following: major ions, physical parameters, nutrients, metals and toxic substances.

10.2 New Glasgow Wildlife Management Area

In September 1989 the New Glasgow Wildlife Management Area (Map 11L/6) was designated by orders in council. Hunting is not permitted within the Management Area although angling is. The Area encompasses approximately one hundred and forty-nine (149) hectares bounded on three sides by Bells Pond Road, Rennie's Road (Hwy #13) and Mt. Tom Road.

10.3 Headland Erosion Monitoring

Parks Canada Branch of Environment Canada has monitored shoreline erosion as part of an ongoing study of erosion within Prince Edward Island National Park. Annual rates of erosion for numerous sites in the watershed dating back to 1981 are available from the National Park office.

10.4 Developing Communities

The Village of Hunter River has been described as a "developing bedroom community" for Charlottetown (Mason, 1989). The village has recently had an increasing number of housing starts. Its leaders are in the process of developing an "official plan". Topics of concern which are being addressed include the identification of sectors which should not be developed as residential areas, the development of a buffer zone along the Hunter River and the necessity of soil testing to determine sewage handling capacity.

This village has an advantage in that it can examine the results of the growth experienced in similar communities which are located closer to Charlottetown. With proper planning and funding, villages such as Hunter River will be able to develop without jeopardizing its surface water resources.

11.0 ACTIVITIES AFFECTING SURFACE WATER RESOURCES WITHIN THE RUSTICO BAY WATERSHED COMPLEX

Many of the problems affecting surface water resources within the Rustico Bay Watershed Complex occur as a result of the high erodibility of Island soils. Soil erosion is

accelerated by poor agricultural, forestry and road maintenance and construction practices. The problems affecting surface water resources on P.E.I. can be placed into three general categories; sedimentation (siltation) sources, pollution point sources and instream obstructions. All problem areas are found on Map 11L/6.

11.1 Sedimentation (Siltation) Sources

The entry of soil into surface waterways is described by the Watershed Inventory Project as a sedimentation (siltation) source. Autumn tillage, particularly plowing with the slope and cultivation excessively close to the streams' edge, often results in extensive landwash and siltation of the Island's waterways. There are numerous examples of this practice within the Rustico Bay Watershed Complex. Improper forestry operations, such as clearcutting on steep slopes and removal of greenbelts along streams and rivers also provides for sedimentation of streams and rivers.

One of the major sources of siltation to Island waterways is caused by the construction and maintenance of P.E.I. roads. Many roads on the Island are unpaved which presents numerous potential sources of sedimentation. Improper grading of these roads, in particular, leaving a ridge of clay and sand at either edge allows runoff water to form channels resulting in erosion to the road surface. Water usually flows alongside these ridges until it "breaks" through, usually at a road-stream intersection. This practice of grading also renders ditches, if present, useless.

Silt-loading of Island streams and rivers does not usually affect the waterway at the point of entry but its effects are impacted further downstream. Soil particles are carried by currents and deposited in the stream covering essential finfish spawning areas. Shellfish beds in the estuaries are also affected in that they are smothered by the silt.

11.1.1 New Glasgow

A 1.0 metre metal culvert at this road-stream intersection does not present problems for fish passage. There is, however, a large deposit of sediment within the culvert indicating an upstream siltation source. Further buildup may cause passage problems in the future.

11.1.2 Red Road at New Glasgow

Improper ditching on an unpaved section of this steeply inclined road results in silt loading of the Hunter River.

11.1.3 Hazlegrove I

Unrestricted cattle access to an unnamed tributary of the Hunter River results in siltation and bacterial contamination of the waterway.

11.1.4 Hazlegrove II

A salt/sand storage area beside an unnamed tributary of the Hunter River is situated adjacent to the River and represents a potential source of siltation and chemical contamination.

11.1.5 Rackhams Pond

The dam which creates this pond has a sandbagged sluice in the center of the berm. During periods of high water flow the dam often washes out around these bags. This frequent breaching causes silt loading of the stream and sedimentation of downstream areas. When the dam is rebuilt after these washouts, it constitutes a barrier to fish passage.

11.1.6 Crooked Creek

Stock watering from this tributary of the Wheatley River causes bacterial contamination and is a siltation source.

11.2 Pollution Point Sources

The entry of non-natural substances into a surface waterway is known as a pollution point source. For example, fertilizer and manure runoff into surface waterways results in bacterial and chemical contamination of the system. Inadequately or improperly treated human sewage, stormwater drainage and the discharge of industrial effluents also contribute to the deterioration of P.E.I.'s surface water quality.

The most recent examples of pollution point sources on the Island have been the entry of petroleum products, specifically fuel oils, into streams, rivers and groundwater aquifers. This has resulted from either transportation accidents or leakage from underground storage tanks.

The result of bacterial contamination is often the eutrophication of the aquatic system. As is the case with siltation, the effects of many pollution point sources are felt in downstream areas. This can result in the closure of shellfish harvesting areas.

11.2.1 Rusticoville

Fuel tanks for fishing boats are stored on a wharf at this location and are a potential contamination hazard to the Hunter River.

11.2.2 Hazelgrove I

This stock watering site, located on an unnamed tributary of the Hunter River, represents a source of bacterial contamination.

11.2.3 Hazelgrove II

Restrictive fencing at this stock watering site on the Hunter River reduces the amount of damage caused by siltation but still represents a source of bacterial contamination.

11.2.4 Hunter River I

Stock watering on this section of the Hunter River represents a source of bacterial contamination to the waterway.

11.2.5 Hunter River II

The proximity of a number of homes to Bagnalls Pond means that they cannot install proper septic systems. Some are reputed to dump their domestic sewage directly into the pond, while others have septic tanks for settling out sediments before the "grey water" enters the pond.

11.2.6 Wheatley River

A feedlot operation uses this small damsite as a water source for cattle. This causes bacterial contamination in addition to silt loading.

11.3 Instream Obstructions

Numerous other factors also influence the quality of the surface waterways within the Rustico Bay Watershed Complex. Fallen trees or other debris in the streams and rivers present problems for fish passage. Improperly installed and unmaintained culverts, insufficient water flow and non-existent or inadequate dam bypass structures not only pose barriers to successful fish passage but also affect the amount of water available for use in downstream areas by other users.

11.3.1 Hazelgrove

A 2.0 metre steel-arched culvert with a wooden floor is a complete barrier to fish passage. There is little or no water

passing through this crossing of an unnamed tributary of the Hunter River and Route #2.

11.3.2 Doirons Creek

The double box culvert at Route #6 and Doirons Creek does not contain sufficient water to allow for fish passage. Installation of a baffled channel in one culvert and the partial blockage of the other would alleviate the problem.

11.3.3 New Glasgow Mills

The dam, located at this site on the Hunter River does not allow for the passage of fish. Trout farms, located above the pond and below the dam, do not have facilities in place for the treatment of wastes which are dumped directly into the waterway.

11.3.4 Mayfield

This recently completed dam has an improperly installed culvert with a 1.50 metre drop on the downstream side thereby creating a complete barrier to fish passage.

11.3.5 Bagnalls Pond

The pond, created to supply water power for a saw mill, has a dam with a 3.0 metre overall drop to the downstream level. Two drops of 1.0 and 2.0 metres each present a complete barrier to fish passage.

11.3.6 Brookfield

The top of the bypass at this dam has a rocky shelf topped by debris. These combine to create a complete barrier to fish passage which is 1.0 metre wide by 0.50 metres high.

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APPENDIX

APPENDIX A

Rustico Bay Watershed Complex Dam InspectionsMayfield

476500-5144700

This recently completed dam has an improperly installed culvert with a 1.50 metre drop on the downstream side. It is a complete barrier to fish passage.

New Glasgow Mills

473400-5141900

All of the water from this mill pond is being diverted into a fish hatchery below the dam. The waste from the hatchery is being flushed directly into the stream below the dam. The diversion is structured in such a way as to completely block fish passage.

Bells Pond

473600-5141900

This bypass pond has an eleven (11) step pool and weir fishway and presents no difficulty in passing fish.

Hazelgrove

469800-5134500

This decorative small bypass pond does not present a problem for fish passage.

Bagnalls Pond

473200-5135700

An operational lumber mill powered by water has a dam with a 3.0 metre drop to the downstream level. The two drops of 1.0 and 2.0 metres each, are a complete barrier to fish passage.

Rackhams Pond

477800-5135100

The dam which created this pond has a sandbagged sluice in the centre of the berm. During periods of high water flow the dam often washes out from around these bags. This frequent breaching causes silt loading of the stream and sedimentation in downstream areas. When the dam is rebuilt after these washouts it is sometimes a barrier to fish passage.

Clyde

469400-5132200

This small bypass pond on the Hunter River presents no problem for fish passage.

Wheatley River477600-5135300

This dam on an unnamed tributary of the Wheatley River is used to create a stock watering site. It is both a source of bacterial contamination and siltation.

Brookfield477800-5129300

The top of the bypass at this dam has a rocky shelf topped with debris creating a complete barrier to fish passage. The obstructions together are 1.0 metres wide by 0.50 metres high.

Hornes Creek482300-5137500

This small bypass pond does not pose a barrier to fish passage.

MacArthurs Pond483900-5139100

Not inspected.